

Application No.: 10/784,725  
Attorney Docket No.: LSP-37  
Amendment Dated: October 26, 2005  
Reply for Office Action Dated: 26 July 2005

REMARKS

Claims 1-23 are pending in the application.

Applicant has amended base Claims 1 and 9. The claim amendments add no new matter. The amendments are fully supported by the original disclosure, e.g., Page 13, line 1 to Page 15, line 8; Figs. 5-6.

Claims 1-2, 8-9, and 23 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,002,102 to Dulaney et al. ("Dulaney" or "Dulaney '102").

Claim 1 (as amended) recites as follows in relevant part:

maneuvering at least said laser transmission end so that said maneuvered laser transmission end has line of sight laser communication accessibility with the hidden surface.

As further recited in Claim 1, the transmission end of the laser peening apparatus "defining an output for laser emissions from said laser peening apparatus."

Accordingly, in the invention, as a result of such maneuvering of the laser transmission end of the laser peening apparatus, laser emissions emanating from the as-maneuvered transmission end are able to propagate directly towards (and impinge upon) the hidden surface, without the need for any further redirection of the output laser emissions (as in Dulaney), since the propagation path for the output laser emissions has direct line-of-sight with the hidden surface (i.e., the claimed "line of sight laser communication accessibility with the hidden surface" for the maneuvered transmission end). This feature is illustrated in Fig. 6 of the application, for example, where the illustrative output laser emissions emerging from lens 38 have line-of-sight access to hidden surface area 46. (Lens 38 is disposed at opening 40 of laser transmission end 24 of laser directing unit 14b of laser peening apparatus 10.)

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However, in Dulaney, the laser emissions 10 from the corresponding "transmission end" of its "laser peening apparatus" are redirected by an appropriate reflector structure to enable the laser emissions to strike the hidden surface, i.e., the "transmission end" of the "laser peening apparatus" in Dulaney does not have line of sight laser communication accessibility with the hidden surface, thereby necessitating the redirection (reflection) of output laser beam 10 in order to gain access to the hidden surface.

For purposes of comparison to the claims, the "transmission end" of the Dulaney system is whatever component emits laser beam 10 variously shown in the figures. ("The present invention solves the problem as shown in FIG. 1 in which a laser beam 10 provided from a laser shock processing system is unable to access and process hidden surfaces 12 disposed in recess 14 of workpiece 16." at Col. 3, lines 62-65.) The "laser shock processing system" of Dulaney would then be analogous -- at least in terms of generating laser beam emissions to effect laser shock peen processing -- to the recited "laser peening apparatus" of the claims.

However, even though a similar problem is addressed -- processing hidden surfaces that do not have line-of-sight access thereto -- the invention and Dulaney provide very different solutions. In Dulaney, the output laser beam 10 generated by the noted "laser shock processing system" does not have line-of-sight access to hidden surface 12, but must be redirected by reflection from a reflective structure appropriately placed in the initial propagation path of the output laser beam 10, so that the reflected beam can then proceed directly to the hidden surface 12. In Dulaney, it is the reflected beam -- and not the original output beam 10 emitted by the "transmission end" of its laser shock processing system -- that has line-of-sight accessibility with the hidden surface. By comparison, in the invention, the laser beam emissions from the

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recited "transmission end" already have a line-of-sight pathway to the hidden surface (hence requiring no further redirection), since the transmission end of the laser peening apparatus is maneuvered so that the "maneuvered laser transmission end has line of sight laser communication accessibility with the hidden surface."

Applicant does not consider the recited "transmission end" of the "laser peening apparatus" of the claims to be met by the various reflection structures of Dulaney, e.g., reflective member 20 (Fig. 3), reflective foil 30 (Fig. 4), roof-shaped reflector 40 (Fig. 5), cone-shaped reflective member 20 (Fig. 6), and reflective particles 50 (Fig. 7). For purposes of comparison with the claims, the "transmission end" in Dulaney corresponds to the terminal component of the stated laser shock processing system from which laser beam 10 is emitted as an output signal therefrom. As shown in the figures, such a "transmission end" in the Dulaney laser shock processing system cannot have "line of sight laser communication accessibility with the hidden surface", since laser beam 10 cannot access hidden surface 12 without redirection (i.e., reflection).

In the invention, then, the laser energy originally generated by the lasing medium 16 is redirected as it propagates from the input end to the output end of the "laser peening apparatus" 10 -- namely, by appropriate maneuvering of the laser transmission end defining the output of the apparatus -- so that the output laser energy emerging from the transmission end has line-of-sight access to the hidden surface. However, in Dulaney, redirection of the laser beam occurs after the laser beam emissions 10 have already emerged as the output from the laser shock processing system. Dulaney accomplishes the needed redirection by placing external objects (reflectors) in

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the path of the output laser beam 10 outputted by the laser shock processing system in order to redirect the laser beam (by reflection) towards the hidden surface.

Dulaney does not teach or suggest any manner of redirection of the propagating laser energy -- as a part of its "laser shock processing system" -- that would result in the output laser beam 10 (from the laser shock processing system) having line-of-sight access to the hidden surface.

In view of the foregoing, Applicant believes that Dulaney does not identically disclose the subject matter of amended Claim 1 directed to the recitations of "maneuvering at least said laser transmission end so that said maneuvered laser transmission end has line of sight laser communication accessibility with the hidden surface" -- where the laser transmission end "defining an output for laser emissions from said laser peening apparatus" -- and then "delivering laser energy, via said maneuvered laser transmission end, upon the hidden surface."

Separately, Applicant believes that Claim 9 (as amended) is patentable over Dulaney for reasons similar to those discussed above in connection with Claim 1.

Moreover, even if the Examiner considers the reflector structures of Dulaney to meet the recited "transmission end" of the "laser directing unit" of the "laser peening apparatus" set forth in Claim 9 -- though Applicant believes that such an assertion cannot be maintained as discussed above concerning Claim 1 -- Dulaney nevertheless still does not identically disclose the subject matter of Claim 9, since Dulaney does not disclose, inter alia, any "laser directing unit" that provides for "variably and selectively positioning said laser transmission end" and "maneuvering of at least said laser transmission end so that said operably maneuvered laser transmission end has line of sight laser communication accessibility with the hidden surface."

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Accordingly, Applicant believes that Claims 1-2, 8-9, and 23 are patentable over Dulaney and respectfully requests that this rejection be withdrawn.

Claims 3-5, 7, 10-12, 16-18, and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dulaney '102 and further in view of U.S. Patent No. 6,288,358 to Dulaney et al.

In view of the foregoing discussion concerning the rejection of base Claims 1 and 9, Applicant respectfully submits that these claims are patentable over the cited art as being dependent from patentably distinguishable base Claims 1 and 9, and requests that this rejection be withdrawn.

Claims 13-15 and 21-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dulaney '102 and further in view of U.S. Patent No. 6,818,854 to Friedman et al.

In view of the foregoing discussion concerning the rejection of base Claims 1 and 9, Applicant respectfully submits that these claims are patentable over the cited art as being dependent from patentably distinguishable base Claims 1 and 9, and requests that this rejection be withdrawn.

Claims 6 and 19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dulaney '102 and Dulaney '358 and further in view of U.S. Patent No. 6,566,629 to Dulaney et al.

In view of the foregoing discussion concerning the rejection of base Claims 1 and 9, Applicant respectfully submits that these claims are patentable over the cited art as being dependent from patentably distinguishable base Claims 1 and 9, and requests that this rejection be withdrawn.

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Applicant believes that the application is in condition for allowance and respectfully requests favorable action in accordance therewith.

If the Examiner has any questions or comments that would advance prosecution of this case, the Examiner is invited to call the undersigned at 260/484-4526.

Respectfully Submitted,

  
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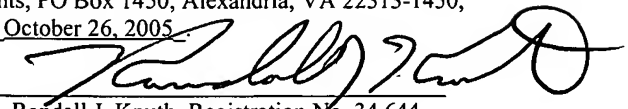
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Enclosures: Amendments to the Claims  
(7 Sheets)  
Explanatory Cover Sheet - Page 1  
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450, on: October 26, 2005.

  
Randall J. Knuth, Registration No. 34,644

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Date